भारत मौसम विज्ञान विभाग

सूचना संचार एंव उपकरण प्रशिक्षण केन्द्र नई दिल्ली

(विश्व मौसम संगठन का क्षेत्रीय प्रशिक्षण केन्द्र नई दिल्ली)

Advance Training Course in Meteorological Instrumentation
&
Information System (B –X)

Date: 29.08.2022	Final Examination	Max. Marks -100
	Paper-I	Time: - 10:30 AM - 13:30 PM

I. Digital and Wireless Communication systems (20 Marks)

Q1 (A) Fill in the blanks/Answer (1×10 = 10 Marks) Any 10

    i.   Full form of MODEM-----------------
    ii.   Give an advantage of Digital signal over Analog signals
    iii.   Give three types of modulation techniques
    iv.   Full form of LTE---------------------
    v.   The modulation technique uses quantization is ---------------
    vi.   Full form of GPRS-------------
    vii.   Full form of QAM is -----------------
    viii.   The variable of carrier signal in FSK modulation is -----------
    ix.   Full form of WIMAX is---------------
    x.   Full form of MSC in mobile communication system is -------
    xi.   BTS in mobile communication is -----------------
    xii.   Communication used in AWS is---------------

Q1 (B) Answer in short (2×5 = 10 Marks) Any 5

    i. What is SNR?
    ii. Explain three types of modulation techniques.
    iii. Give some characteristics of 2G mobile communication.
    iv. What is base band signal?
    v. What is MAC address?
    vi. Describe functions of MUX and DEMUX.
    vii. What is the difference between Data and Information?

II. <u>Antenna and Wave propagation</u> (20 Marks)

Q2 (A) Fill in the blanks (1×5 = 5 Marks) Any 5

   i. Refractive index of air is -------------
   ii. The antenna mostly used in TV Dish----------------
   iii. The wavelength of S-band radar is ----------------
   iv. The layer disappears during night time in ionosphere is --------------------
   v. The height of ionosphere----------------
   vi. Ground wave propagation is also known as ----------------------
   vii.The Frequency band used for ground to aircraft communications -----

Q2 (B) Short answer type Questions (2 ×5=10 Marks) Any 5

   i. What is the value of maximum usable frequency when the incident angle is 60° and the critical frequency is 4.5 MHz?
   ii. What should be the phase difference for total constructive and total destructive interference?
   iii. Communication through LOS can be increased by decreasing the height of antenna. This statement is True/False. Give answer with reasons.
   iv. What is skip distance?
   v. Which of the following frequency is greater than the critical frequency? Give reasons
     (a) MUF (b) LUF (c) Optimum frequency (d) VLF
   vi. Calculate the range of line of sight communication for standard atmosphere when h_t is 52 m and h_r is 13 m
   vii. Define interference.

Q2 (C) Long Answer Type Questions (5 Marks) Any 1

   i. Write a short note on ionosphere.
   ii. Write a Short note on Multipath fading.

III. Networking and Security Systems (20 Marks)

Q 3 (A) Fill in the blanks (1 × 5 = 5 Marks) Any 5

    i.   WAN stands for ----------------
   ii.   OSI stands for -------------
  iii.   Layer 5 in OSI model is --------------
  iv.   In the network a machine is identified by unique address called-------
   v.   DNS denotes -----------
  vi.   Ipv4 address is ----------bits long.
 vii.   Fiber optics cable works on -----------principle.

Q 3 (B) State True or False with reasons (2 × 5 = 10 Marks) Any 5

    i.   IP address is a sequence of four digit numbers separated by coma.
   ii.   Speed of LAN is less than WAN.
  iii.   Router and switch both operates on data link layer and network layer only.
  iv.   A server cannot run on a workstation computer.
   v.   A hub connects two WANs.
  vi.   MAC address is 32 bit physical address of machine.
 vii.   The standard protocol of internet is Ethernet.

Q 3 (C) Answer briefly (1 × 5 = 5 Marks) Any 1

    i.   Explain OSI model with layers.
   ii.   Give TCIP/IP protocol set structure.
  iii.   How to set up a LAN?

IV. <u>GTS and WMO/GTS data procedure</u> (20 Marks)

Q 4 (A) Fill the full form (1 × 5 = 5 Marks) Any 5

    i.   MPLS ------------
   ii.   GTS -----------
  iii.   BUFR -------------
   iv.   NET CDF format-------
    v.   NKN -----------
   vi.   WIS --------
  vii.   WMO --------

Q 4 (B) Answer briefly (3 × 5 = 15 Marks) Any 5

    i.   Brief the data format used in GTS.
   ii.   Give the advantages of GTS communication.
  iii.   Main differences between Leased line and VPN.
   iv.   Explain some salient features of NKN.
    v.   Explain some salient features of VPN.
   vi.   What is the difference between BUFR and ASCII format used in GTS?
  vii.   Explain the WMO file naming convention.
 viii.   Customers use VPN primarily to reduce operational costs. Whether this statement is True/False? Give reasons.

V. **Concept of Networking and IMD networks** (20 Marks)

Q 5 (A) Fill in the blanks (1 × 10 = 10 Marks) Any 10

i.   A Computer that connects to the Internet is called the ....

ii. A wired network that is found in a single building is a ....

iii. A device that sends the message to every computer in the network is called a ....

iv. .... uses light for transmission of data and is capable of transferring large amounts of data.

v.   The Internet is an example of ....

vi. A Network device that checks the address of a message received and sends it to the appropriate computer is called a ....

vii. A WLAN uses a radio .... Router to connect devices to each other.

viii.   .... is owned and operated by the Corporation or Government.

ix. Cable television is an example of ....

x.   A network device that provides a hardware interface between a computer and a network so that computer can communicate over the network is called a...................

xi. A powerful computer that provides service to many users, such as creating an email account, is called a ....

xii. The internetworking protocol is known as ....

Q 5 (B) Answer in brief (2 × 5 = 10 Marks) Any 5

i.   What is a computer network?

ii.   What are the components of the network?

iii.   What is a network protocol?

iv.   State different types of mail protocols

v.   What is ARP protocol?

vi.   What is the use of router?

vii.   What is SADIS?

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